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THE VOLUTE IN ARCHITECTURE AND ARCHITECTURAL DECORATION WITH PARTICULAR REFERENCE TO ITS INTRODUCTION INTO THE IONIC ORDER

BY

REXFORD NEWCOMB

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THE VOLUTE IN ARCHITECTURE AND ARCHITECTURAL DECORATION WITH PARTICULAR REFERENCE TO ITS INTRODUCTION INTO THE IONIC ORDER.

I. INTRODUCTION.

1. Purpose of the Study.— Concerning the use of the volute in connection with the Ionic order much has been written. Varied and fanciful theories have been advanced to explain or prove its origin. But scarcely anything has been written concerning the wide use of the volute in other structural and decorative architectural forms or the lessons to be drawn from this use. As a matter of fact the volute is one of the most universally used of all art motifs, its early use as decoration antedating by many centuries its incorporation into the Ionic capital. It was with view to pointing out the universality of the use of the volute and the bearing that this fact has upon the development of the Ionic order that the present study was undertaken.

It is hoped, furthermore, that it will be possible to prove that the volute as an art form is a natural outcome and a logical result of our living in the kind of an environment that we do. To the writer the volute seems inseparably linked with nature, a configuration very natural to living cellular forms. Surely with the appreciation by man of this principle in nature, it becomes a part of his natural experience, a thing to be felt, as is rhythm or color. Thus it would seem childish to explain the introduction of the volute into the Ionic order as the result of man's imitation of the curve of any particular natural form such as that of a sea shell or a ram's horn, or to attempt to account for that introduction by the fact that certain spiral forms were extant in

this or that country at a given time. Spiral forms are in all countries at all times under one guise or another. The volute has a much deeper and more fundamental meaning than any of those that have been set forth and claimed for it in the past. It is a principle in nature, a very potent and fundamental law of growth, appreciable in all forms from the lowest to the highest. What man experiences so universally in nature and feels so fundamentally he is pretty likely to incorporate into his artistic expression. In other words, the volute had become, in very early times, an abstract though dynamic principle in thought and life, and, in art, "an element of beauty" appreciated by the mind of man, that appreciation predicated, to be sure, upon biological and geological conditions," an element" akin to rhythm, balance, coherence and the various progressions in nature that have found their way into art.

It is hoped that it will be possible to develop this method of approach in order that it may possibly explain the extremely wide and varied use of the volute in architecture and ultimately set forth, what seems to the writer, the natural and logical excuse as well as the valid argument for its existence in an order of architecture.

II. THE VOLUTE.

1. Definition.-- The volute or spiral is defined in mathematics as, any plane curve formed by a point that moves around a fixed centre continually increasing its distance from it, or again as, the locus of the extremity of a line (or radius vector) which varies in length as it revolves about a fixed point or origin. These are general definitions and do not adequately describe the regular spiral which is known in mathematics as the Spiral of Archimedes and defined thus: a curve formed by a point moving with uni-

form angular velocity and receding from the centre at a uniform rate.[1]

This last defined curve more nearly coincides with the kind of a curve that is most frequently encountered in art. It is not, however, the spiral of nature. In other words, the spiral of art and architecture in not the curve of nature any more than any other art motif is identical with its inspiration in nature,[2] but it is the curve of nature idealized and conventionalized into something more nearly approaching the abstract or ideal. That is, after all , the artistic process. Art, if it is anything, is nature plus man's idealism. So then the volute in architecture occupies a place similar to that of Venus de Milo, which is not what any Greek woman ever was but what every Greek woman desir- to be, -- that is, the Greek woman idealized; it is not the volute of the ram's horn, or the nautilus, the snail shell, or wave motion. It is all of these, or the motif in all, idealized and conventionalized from the natural originals.

We must not lose sight of the fact that the great majority

1- T.L. Heath in "The Works of Archimedes" defines the spiral thus: "If a straight line drawn in a plane revolve at a uniform rate about one extremity which remains fixed and return to the position from which it started, and if, at the same time as the line revolves, a point move at a uniform rate along the straight line beginning from the extremity which remains fixed, the point will describe a spiral in the plane."

2- Ruskin in "Modern Painters", Vol.IV., Chapt. XVII discusses the mathematical development of the spiral of nature. Its form and development is illustrated by Fig.1.

of art motifs owe their birth to attempted realism. Forms are meant first to be life-like, or at least, suggest real objects. Conventionalization follows realism.[1] But even primitive man was not content merely to represent realistically various spiral forms, so that the earliest spirals that we find, although they are used in connection with animal or plant forms, are usually used conventionally rather than naturalistically.

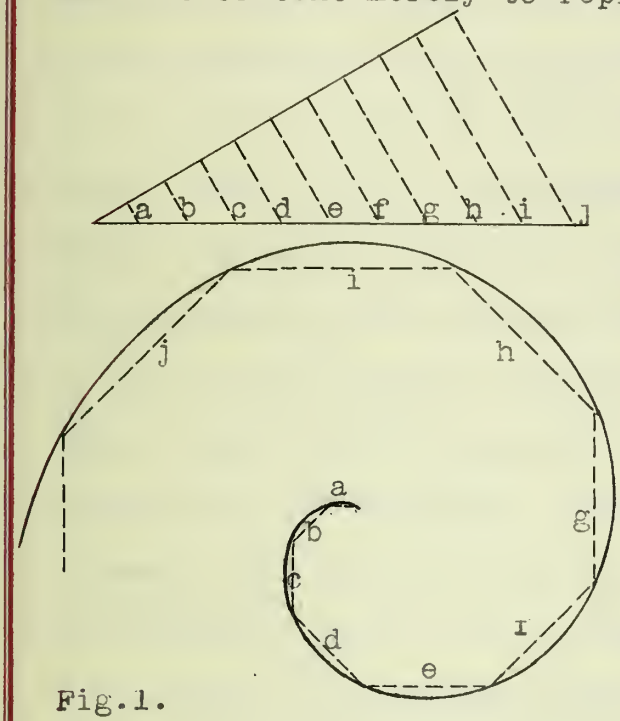

Fig.1.

2. Attributes of the Volute.-- In this connection it will be interesting and valuable to interpret something of the spirit or feeling of the volute. The volute is, perhaps, two-fold in its meaning. It is particularly unified in that it is related to a definite point or centre, yet it is universal and all-embracing in that it is ever-widening as it recedes from that centre in its generation, and infinite in its conception. Ruskin[2] has remarked "the inherent power of all representations of infinity over the human heart". Moreover, the volute is capable of two interpretations depending upon the way the mind follows the curve. It may mean from a very particular, definite point out into the everywhere or it may mean just the reverse, from infinity into the finite, particular centre. Thus it serves

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1- Haddon, "Evolution in Art", 7.

2- Ruskin, "Modern Painters", Vol. II, 99.

infinity into the finite, particular centre. Thus it serves well as a terminating motif in art, doing equally well as a beginning element or as an ending motif. This same terminating characteristic is appreciated in nature. In certain of the animal forms the centre is the beginning, the process of growth being from this centre outward. This is true of the spiral shell forms such as the chambered nautilus, snails and other forms. In others the process is reversed as in the ram's horn which grows out and curls up as it grows. This latter process is true of most plant tendrils. However, the unfolding fern frond obeys neither progression. It comes through the surface of the ground fully voluted and then unrolls. Abstractly, however, we generally conceive the volute as progressing from the centre outward in an ever-widening sweep.

Moreover, the volute always inspires one with its dynamic character. It is one of the most engrossing and interesting curves in nature or art, and though not so difficult to trace as some of the interlacings found in art, it is, never-the-less, a rather involved curve for the human eye. It is involved enough to have considerable of the mysterious in it and, perhaps for this reason, has been widely used in art. It is, however, scarcely as beautiful as some of the subtle "S" curves found in nature and perpetuated in art.

3. Origin of the Volute.-- The introduction of the spiral or volute into art and its travel from the place of its early conception as an art motif to the various early cultural centres has been the subject of many discussions. So wide, however, is the geographical distribution of the spiral in art, savage

and civilized, that it would seem that its introduction must have been made at many widely separated and unrelated geographical points.[1] May it not have sprung up spontaneously in many cultural centres?[2]

Just what was the source of the spiral motif is not so plain. Two theories concerning this origin have a place in any discussion. These are the theories that derive the spiral: (a, from nature or,(b, attribute it to a techno-morphic origin. Of the first there is considerable to say. Nature has been very prodigal with her use of spirals or spirally inclined curves. The spiral curve is found throughout the earth in one form of life or another. Of the universality of this curve, we have ample proof in the spiral nebulae found in the heavens about us.[3]

In plant life, the spiral is a frequently occurring structure, appearing in fern fronds, tendrils and leaf curvatures. The vegetable origin of many volutes in art is betrayed by their use with vegetable or floral forms, and indeed this affinity is so marked that it has been the basis for an argument deriving all

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1- See Breasted, " A History of the Ancient Egyptians" 253, also
Bell, "Architecture of Ancient Egypt", 76.
Hamlin, "History of Ornament", 46.
Evans, "Scripta Minoa", 126.
Miss Hall, "Decorative Art in Crete in the Bronze Age", 9.
Baikie, "Sea-Kings of Crete", 48, 193, etc.

2- Taylor,"The Origins of the Aryans", 52, 132.

3- Herbert, " First Principles of Evolution", 15.

the spiral or voluted forms from the Egyptian lotus.[1]

In animal life, the spiral is, if anything, more frequently occurring than in plant life. It is of especially frequent occurrence in sea life, being found in such forms as the chambered nautilus, various "spirula", "volutidae" and numberless other forms. (Fig.2) It is characteristic of a whole family of land shell-bearing creatures, typified by our common snails. Moreover, it is a habitual bodily configuration of many animal forms such as worms and snakes and is often the curve, found in the horns of certain sheep and goats, as well as a characteristic termination to the antennae of many insects.

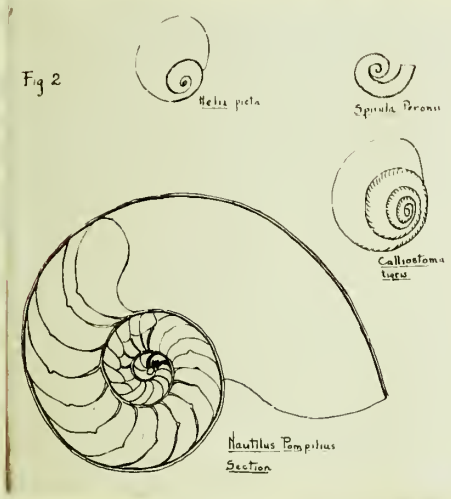

Fig. 2.

The origin of the spiral has often been attributed to a conventionalization of the water and wind motion[2] and for this reason is often called the "wave motif".[3]

1- Goodyear, "Grammar of the Lotus".

2- Holmes and Cushing, " Annual Report of the Bureau of Ethnology", IV, 460. "This same figure, in use by the Indians of the interior of the continent, is regarded as symbolic of the whirl wind, and it is probable that any symbolizing people will find in the features and phenomena of their environment, whatever it may be, sufficient resemblance to any of their decorative devices to lead to a symbolic association. See also 515.

3- Hamlin, Op. Cit.,46, 97.

The techno-morphic origin of the spiral has been well developed by Dr. Holmes[1] in connection with his attempt to account for this motif on much of the pottery of the American Indian. Basket building with the Indian consisted, in many cases, of "raising" the basket by a coiling of grass ropes, previously prepared, and of stitching or securing each succeeding coil to the one below it. This same method, in the absence of a pottery wheel, was used in "raising" pottery forms.[2] This method of making vases has, no doubt, been practiced in all lands. Thus when the basket or pottery, thus formed, was ready for decoration, what would be more appropriate and natural than the curve, the symbol typifying the spirit or principle of its construction?[3]

Everyone is familiar with the coils of hair that have been worn by females from the earliest of times. This techno-morphic origin of the Ionic volute has been utilized by the Latin authority, Vitruvius,[4] in his explanation of that form. Moreover, the spiral or volute is arrived at, techno-morphically, by the rolling up of skins, metal or paper.

Now it appears that, in certain quarters of the globe, the spiral may have resulted from techno-morphic origins but with the wide distribution of spirals and spirally inclined forms in all nature about us, it must be conceded that man must have

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1- Holmes, "Origin and Development of Form and Ornament in Ceramic Art", 4th Annual Report, Bureau of Ethnology, Wash. 1886.

2- Mason , "The Origin of Inventions" Chapt. V.

3- Elliott, "Prehistoric Man and His Story" 296-7.

4- Vitruvius, Book IV, Chapt. I., "in the capital they placed the volutes, hanging down at the right and left like curly ringlets".

appreciated the curve of the sea-shell, the spiral motion of the breaker upon the beach, or the spiral tendency of the floral forms long before he actually encountered the spiral in connection with industry. Indeed, this very principle, appreciated in nature as a natural and logical method of construction (since it is so prevalent in plant and animal structure) may have led to this method of basketry or vase making.

The spiral, then, is a natural form, a form predicated upon natural structure. Curvature is a law of nature remarked by Ruskin[1], and will be found in one form or another in all and through all forms of nature. These curves about us have determined our ways of thinking. Thus, the human mind finds curves more pleasant than right lines and the curves that approach infinity the most interesting and pleasing. The spiral, because it is among the curves more nearly infinite in conception, has held, from very early times, a great appeal for the mind of man, and has, for that reason, entered very deeply into his artistic expression.

Whether or not it can be set down that the spiral is conventionalized wave motion, the representation of a sea shell, or the curve of a ram's horn is immaterial. It is possible that all of these and many more may have inspired early artists, at one time or another. Whether or not the spiral was developed, originally, by a techno-morphic or a nature-inspired process is likewise immaterial. This particular curve is one of the few configurations open or possible to organic forms because of

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1- Ruskin, "Modern Painters" Vol II., 200, Vol IV., 187.

their cellular structure, and hence is natural, and whether developed, at first, techno-morphically or not, is predicated upon this natural law.[1] It would seem no more than reasonable, however that this form entered art like most other forms, that is from nature-inspired beginnings.

So then, in the last analysis, it must appear that the spiral is typical or representative of a law of growth in nature and stands for a more fundamental principle in life and art than the mere representation of any one particular form, imitatively, by man would indicate. Once into art, from whatever source, it became a popular and engrossing motif for reasons already pointed out. Its popularity has prevailed and will continue to prevail as long as the mind of man bears the same relation to nature that it now holds. In other words, the volute continues in art because it is in nature.

Now while the volute as a motif has continued perennially interesting and beloved, the application of the volute in art is a thing that has changed and will continue to change. It is this changing use of the volute with which we are now concerned.

III. EARLY USE OF THE VOLUTE.

1. In the Arts-- Early man, by virtue of his mental limitations, demanded that he see the actual line of the spiral curve. This demand led to the doing of many primitive spirals

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1- All cellular linear forms, under process of taking on any configuration other than that of a straight line, approach the coil or spiral. The peculiar relationship of cells prohibit angles and lines.

found in many parts of the world and dating back to the Bronze and even to the Stone Age.[1] In later times, however, the spiral or even running spirals formed the backbone of much decoration in which the line of the spiral was largely hidden or obliterated by other detail. Even paintings have been conceived upon the volute as a motif, although the volute line itself is implied in the finished work. A good example of this sort of thing would be Burne-Jones' "Golden Stairs" (Fig. 3,

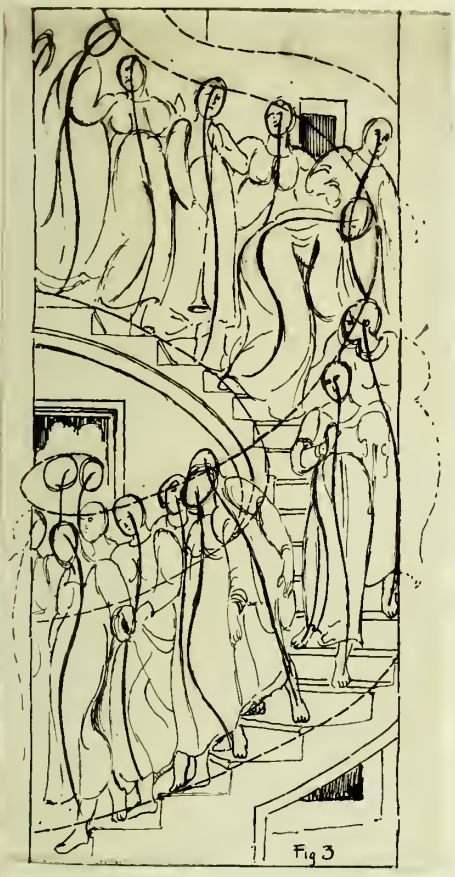

Fig. 3.

The earliest spirals may be said to geometricalizations of nature, although some from the Bronze Age appear as of techno-morphic origin, and to have originated as small coils of metal and not as conventionalizations of nature at all. Many examples of the two classes have been found in excavations throughout Europe, principally in Scandinavia, Ireland, Hungary, North Italy, Greece, and Egypt.

Most of these early spirals, with the exception of some in Ireland, Greece, and Egypt, were used as decoration upon useful objects; arms, utensils, annulets, and fibulae. The spirals of

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1- See Avebury, "Prehistoric Times", 19, 44, 46 etc.
Ward, "Historic Ornament", Figs. 39, 40, 41, 47, 50, 55, 57.
Rolleston, "Myths and Legends of the Celtic Race", 70.
Munro, "Palaeolithic Man", Plates LII, XXXIX, LXVIII, LXX.
Reinach, "Apollo", p 13, Fig. 12.

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Ireland, good examples of which we have surviving to this day, were cut upon stone monuments of one sort or another. Mr. Rolleston, in speaking of the spiral stone decorations at New Grange, Ireland, says, "Except for the large stone with spiral carvings and one other at the entrance of the mound, the intention of these sculptures does not appear to have been decorative except in a very crude and primitive sense..... The designs are, as it were, scribbled upon the walls anyhow and anywhere. Among them everywhere the spiral is prominent. The triple and double spiral are also found, as well as lozenges and zig-zags".[1]

Lord Avebury,[2] in remarking the differences in ornament, in the Stone and Bronze Ages of northern Europe, shows that circles and spirals were more prevalent in the Bronze Age than in the Stone Age. The Egyptian spirals of earliest occurrence were carved upon annulets and are generally geometrically executed, thus showing that the abstract curve was appreciated and loved aside from its association with any particular natural form. In the early Egyptian annulets, the spiral is used as a space-filling motif around the scarabaeus.[3]

This is not true, however, of the spirals of just a little later period in the history of the race. The introduction of metals; bronze,gold, or silver made possible a much wider artistic expression, and especially was this true of Mycenae, where have been found such golden disks as are shown in Fig. 4

1- Rolleston, Op. Cit., 70.

2- Avebury, Op. Cit., 19, 44, 46.

3- Hamlin, Op. Cit., 51, 53.

and Fig. 5. Here spirals appear, although geometrical in spirit, as the antennae of butterflies and arms of octopi. These disks, together with certain vases found at Mycenae and in Crete, show spiral forms midway between the very abstract spirals of early peoples and the more naturalistic spirals as seen in Egypt and especially in Assyria, where antennae, animal horns, and even hair have been given a spiral turn, but always in a naturalistic spirit[1] and never geometrical as at Mycenae. (Fig.6).

Fig. 4.

Spirals of floral origin select principally Egypt and Assyria for their first appearance. Perhaps the earliest of this type is the Egyptian lotus spiral. The priority, even here, is a matter of great debate among archaeologists, some maintaining that Egypt originated the spiral motif and passed it on to the Tigris-Euphrates civilization and the Cretans, while others maintain that the reverse was true and that the spiral came from Crete into Egypt.[2]

2 In Architecture-- Bell[3] in speaking of the palace of Amenhotep IV, situated upon the right bank of the Nile two hundred miles below Thebes says, "It is said that the spiral was first used as an architectural ornament in this building" However this may be, spirals of distinctly floral origin are also to be

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1- See Jastrow, "Civilization in Assy. and Baby." Plates 31, 53.

2- Baikie,"Sea Kings of Crete", 142.

3- Bell, "Architecture in Ancient Egypt", 82.

found as wall and ceiling decorations in the Theban tombs of the XVIII to the Xx dynasties,[1] the use of spiral ornament becoming well authenticated and much used from that time on. Nor was the spiral ornament of the lotus type confined to Egypt. Many examples have been found in early Greek cultural centres, especially at Mycenae, in the Palace of Tiryns,[2] the ceiling of the flat-roofed chamber of the beehive tomb of Orchomenos in Boetia,[3] which is a well known example. Comparing the Greek example, just cited, with the well known Egyptian examples, it certainly appears, on account of its less skillful handling of the flower and its cruder execution, the copy rather than the original.

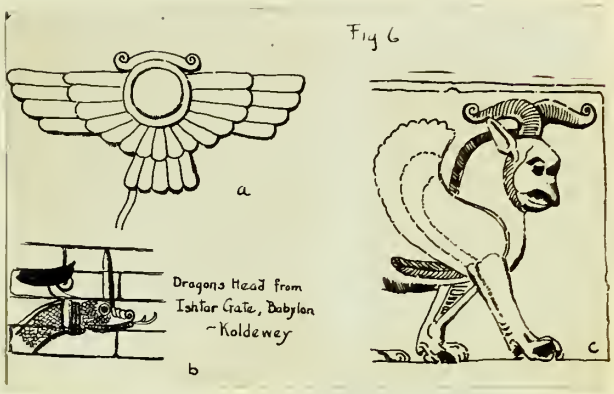

Fig. 6.

Other examples of floral spirals are to be found in Babylonia and Assyria. Fig. 7 shows an Egyptian king holding a lotus stalk.[4] This small ivory carving was found in Assyria and goes to prove, among other things, the intimate connection between Egypt and Assyria at a very early period. The interesting thing about this, however, is the voluted leaf at the base of the stalk. Here spirally inclined forms are

Fig 7 Ivory Carving
British Museum.

1- 1600 to 1100 BC (Berlin dating, or 1580 to 952 (Petrie,.

2- See Durm, "Baukunst der Griechen", Plate opposite p. 31 or Schliemann, "Tiryns" Plate V.

3- See Perrot and Chipiez, Vol VI.

4- See Guide to the Babylonian and Assyrian Antiquities, British Museum, 1908, 22.

leaves and not the flowers themselves.

Another floral spiral form is to be found upon another small carved ivory block from the same case in the British Museum.[1] (Fig. 8) It represents the Assyrian sacred tree, a highly conventionalized form. The curious thing about these volutes is that they more nearly resemble animal horns than floral forms at all. Near the top of this fragment is shown two pairs of volutes setting vertically against the central trunk and bound with thongs. These volutes resemble very closely in form and position the volutes used later, in Persian times, upon the columns of the Propylaea at Persepolis. (Fig 9). This use of the coupled voluted forms appears to have been widespread in Assyria and was a favorite motif in furniture decoration, in most cases having the curious little point at the division of th volutes noted in Fig 10. In this connection it will be noticed that in all the Assyrian volutes the spirals spring vertically from the stalk or stem, and always appear as added decoration and not, in any way, related to structure.

Fig. 8.

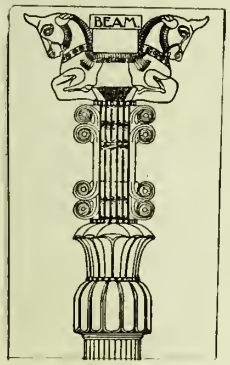

Fig. 9.

Mention has already been made of the wave motion spirals (p. 7) and spirals of this origin are often encountered in Assyrian ornament.[2] In these Assyrian examples the spirals are isolated and not running

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1- Table-case F, No 87, Nimroud Gallery, British Museum.

2- See Jastrow, Op. Cit. Plates VII, LXIX, and Maspero, "Ancient Egypt and Assyria", 256, 257, 334.

as was true of the "Greek wave" of a later period. (Fig. 11)

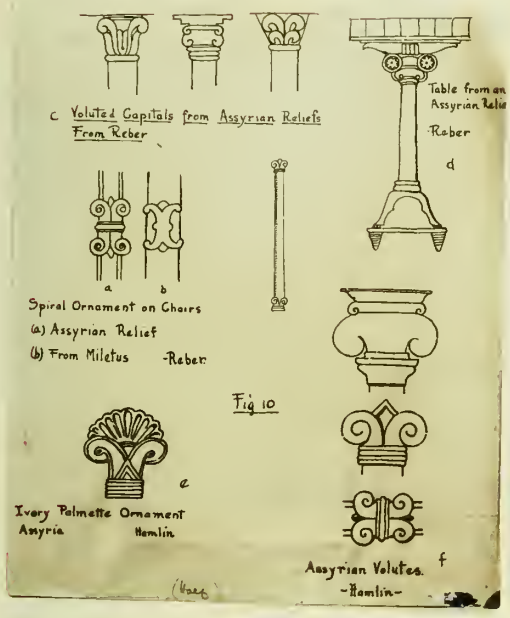

Fig. 10.

They occur usually in conventional representations of water, the general body of water being represented by parallel chevrons or parallel undulating lines, with here and there a spiral wave.

These varied uses in early art around the Mediterranean are introduced to prove the varied distribution of this very universal curve, a curve which presents methods of handling, so different from each other in the different countries, that we must conclude that it developed, even if it did not originate, independently in the various cultural centres. So far the spiral has been one of pure decoration, either as a beginning or as an ending motir in connection with other forms, animal or floral; as a running ornament, or an all-over decoration upon plane surfaces. So far we have encountered the spiral or spirally inclined curves in Egypt, Assyria and the Aegean Area, the three centres of early culture so far as classical civilization is concerned, facts which must indicate that the spiral was appreciated in all these countries from very early times.[1] In this connection, however, it should be noticed that the spiral has been little used for architectural ornament, except in Egypt and

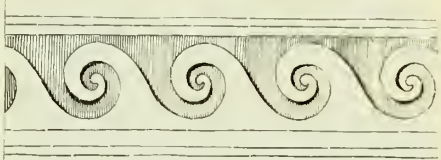

Fig. 11

1- The forms as found in these three centres indicate a long period of development.

Greece. In fact, it can be definitely shown that spirals were never used as geometric decoration, to any extent, in the Tigris-Euphrates Basin.

Now the question is naturally raised in the student's mind as to whether the spiral came from Egypt to Assyria and thus to Asia Minor and Ionia, as has often been claimed. Thus it will be necessary to discover, if possible, the route of the spiral motif. Did it originate in Egypt, pass into Assyria and then on to Asia Minor and Ionian hands, and then on to Greece; or did it pass from Egypt into Crete, Boetia and other centres in Greece and pass with the Ionians, in the migration from Boetia and Attica, to Ionia on the west coast of Asia Minor?

At first the settlement of this question would seem to have little bearing upon the question of the origin of the Ionic capital. A spiral would seem a spiral by whatever route it arrived. But in reality, the settlement of this question will determine for us whether we shall be obliged to consider the Ionic capital as having developed from the decorative, spirally inclined, floral motif of Assyria into the structural motif of Ionia or whether we shall be permitted to see in this form the indication of a lost structural prototype. If it came from Assyria, decoration preceded structure[1] and the perpetuation of a decorative form occasioned the introduction of a structural entity; if it came from Greece, we are able to account for the structural origin of the capital first and its decoration as a logical elaboration of that structure.

1- This is the origin held by all adherents of this theory.

The question as to whether the spiral came from Egypt into early Greece, i.e. Crete, Boetia and Mycenae, need not be considered here. It is not vital to the present discussion, whether this or the reverse[1] was true. We have the geometric spiral, as contrasted with the spirally inclined, decorative forms of Assyria, in early Greek art, in both handicrafts and architecture. The question stands; did the spiral go to Ionia by way of Greece or by way of Assyria?[2]

The Ionians, in the time of Herodotus, claimed to have inhabited twelve cities in the northern Peloponnese and to have been driven from these cities into Attica by the Achaeans, who were in turn driven out by the on-coming Dorians.[3] From Attica they were led by sons of King Codrus of Athens to the Asiatic coast, where they settled at Miletus.[4] Lang, in summing up the movements of these peoples, says, "It thus appears that the people later called, in Asia, "Ionians", had been dwellers on the coasts of Boetia and Attica as well as in the northern Peloponnese".

Now, just who composed the Ionians of Asia Minor is not plain. Herodotus describes them as a "mixed multitude" and includes among them Phocians, Arcadians, Cretans and others.[5] The name, no doubt,[6]

1- As Hall (H.R.) and Evans contend.

2- A mass of evidence, not to be overlooked, is encountered in the finds upon the Danube and Po Rivers, in Scandinavia and in Ireland. Why do we not find Assyrian influence indicated in these spirals?

3- Lang, "World of Homer", 140.

4- Ibid, 142.

5- Leaf, "Homer and History", 60, 296-297.

6- After their fabled leader, Ion.

was applied after the arrival of the emigrants in Asia.

The time of the Ionic migration is as yet not definitely settled but late research places it after the Dorian invasion, and thus, after the Aegean period of Greek history. "Without assuming any definite date, we may say", says Sir Edward H Bunbury, "that recent research has tended to support the popular Greek idea that Ionia received its main Greek element rather late and therefore after any part of the Aegean period"[1].

These conclusions are based upon archaeological finds and archaeology is now depended upon to solve the Ionic question.[2] In the absence of architectural remains of the earliest Ionic period, that would prove, beyond a doubt, the origin of the Ionic order, we must, obviously, consider the other archaeological evidence.

We have, due to the excavations of Schliemann, Evans and others, something of an idea of the culture that had flourished before the departure of the Ionians for Asia Minor. The resemblance between the structures of Sparta[3], in the Peloponnese, and one found at Neandria[4], in the Troad, has been remarked by other writers. The votive objects found at Sparta included pottery in the "geometric post-Aegean style", together with ivory-covered fibulae bearing many Aegean motifs, among which is the "double-coil"[5], also characteristic of the Po and Danube Valleys.

1- Bunbury, "Ionia" in Britannica Encyclopaedia. 11th Edition.

2- Hogarth, "Ionia and the East", 12.

3- The Spartan finds were made within the precinct of Artemis Orthia at Sparta by the members of the British School of Athens. It is described as,"the remains of a temple in crude brick with wooden framework"

4- Lang, Op. Cit. 145, 5- Munro, Op. Cit. 385, 415, 467.

Other finds upon the site of the Ionic Temple of Artemis at Ephesus (700 B.C. ?),made possible by the excavations of Mr Hogarth, serve to show the intimate relationship of early Ionic art of Asia to that of the Greek mainland. Here, Mr Hogarth found thousands of votive offerings in gold, bone, ivory, paste, and crystal, ornamented with well accepted Aegean motifs, such as the "spectacles", a kind of double spiral, the "double axe", spirals, two animals opposed in heraldic fashion.[1] These finds[2] which he dates at about 700 B.C., or about two hundred years after the traditional migration, bore a closer resemblance to pure Aegean work than did the contemporaneous work in Greece. This will not seem strange, perhaps, when we consider the mixture of blood taking place upon the mainland, due to the immigration of northern elements.

This same resemblance between the Ionic minor arts and those of the Mycenean centres is called to our attention by Fowler and Wheeler,[3] who say,"In general it may be said that in the development of early Ionic ceramic art there are found more reminiscences of Mycenean art than appear in the early styles of Greece proper, and this fact is rightly deemed of high importance, since the direct relation of Mycenean art with that of Greece is as yet insufficiently established.----Motives taken from plant life are characteristic and point very likely to a Mycenean survival". Mr J.H. Hopkinson[4] recognizes the "Sub-Mykenean"

1- As upon the Gate of Lions at Mycenae.

2- There is no doubt now but what these were executed in the temple as goldsmith's refuse has been discovered in the temple.

3- Fowler and Wheeler, "Greek Archaeology", 455.

4- Hopkinson, Journal of Hellenic Studies, XXII, 47.

character of the ware of the Ionic islands.

Professor John L Myres[1] of Oxford, in speaking of Ionic culture, says, "Ionic culture and art, though little known in their earlier phases, derive their inspiration on one side from those of the old Aegean(Minoan, civilization, on the other from the oriental (mainly Assyrian) models which penetrated through the Hittite civilization of Asia Minor[2]. Egyptian influence is almost absent until the time of Psammeticus, but then becomes predominant for a time." Thus it will be seen that the culture carried into Asia Minor was Aegean and there is a question about much of the so-called Hittite influence upon the Ionian Greeks, who occupied a situation very near to Greece proper but considerably removed from the centre of Hittite power. Here we must remark the wide difference between the spirals of Greece proper and those of Egypt and Assyria.

The great number of true geometric spiral ornaments[3] upon the Greek mainland during the Aegean period, as well as the general use of spirals of single and double roll in the Valleys of the Danube and Po, must indicate something of the derivation, or at least the early distribution of this form, as far as the north side of the Mediterranean is concerned. The wide prevalence of this form is one of the striking archaeological facts in connection with arts of primitive peoples from Greece to Ireland.

1- Myres, "Ionians" in Ency. Brit. 11 Edition.

2- Hogarth, "Hittites", in Ency. Brit. says, "The Greeks came too late into Asia Minor to have had any contact with Hittite power, obscured from their view by the intermediate and secondary state of Phrygia".

3- See spiral fibula, "The Argive Heraeum" Vol II, Plate 85. Suchhardt, "Schliemann's Ausgrabungen" Fig 146 etc.

Upon the other hand, the spiral ornaments of Assyria, Persia, and the Tigris-Euphrates region in general are not pure, geometrical spirals, as we have in Ireland, the Danube Valley or at Mycenae and Knossos, but are spirally inclined curves used in connection with other forms, principally animal and vegetable, as shown in Figs. 6, 7, 8, 9, and 10. Had the use of the spiral among the Assyrians have been anything like as widespread as among the Greeks, the excavations would, surely, have yielded some examples before now. Moreover, the absence of any spiral architectural ornament, such as has been found in Greece from the earliest times, certainly argues against the volute's having come from the East. We must look for the origin of the Ionic, spirally decorated capital not in Assyria but in Greece, or at least among the Grecian peoples. And furthermore, too much emphasis should not be placed upon the spirals which, from all appearances, are, after all, only decoration for a form that called for such decoration, and not the inspiration of that form in the first place. We must look further and beyond this decorative feature for the origin of the form. The shape, the configuration of parts, had to exist structurally before it could be decorated at all.

An intensive study of architectural evolution has led the writer to the conviction that, what is at one time structure, becomes, in a succeeding age, decoration. There are many examples to prove this law in architectural evolution and in other evolutionary processes, for that matter. In biology we have similar examples of organs persisting long after their functional value has ceased to exist. In art the mind demands, from long association, the perpetuation of forms that have ceased to have a

significance and these elements persist always as ornament upon succeeding structural forms. And, if the old theory[1] of the origin of the Ionic order be true, and the structural volute of the Ionic capital became such from the decorative, Assyrian, floral volutes, it is the only example of a reversal of the foregoing law with which the writer is acquainted. The old theory of the origin stands at variance with all our ages of architectural experience. This fact, in itself, serves to make the theory questionable.

Semper,[2] a German architect-critic seems to have been among the earlier devotees of the Assyrian palmette theory, in which he derives the Ionic capital from the Assyrian palmette by a "process of gradual suppression of the leafy part and an increase of the scroll".[3] Dr Clarke further elaborated and supported the theory of Semper. Goodyear sees no reason for seeking the Assyrian origin when evidence of its direct lineage from the Egyptian lotus is so apparent.[4] Marquand seems to agree as to this origin of the motif, when he says, "This type of decoration seems to have been derived from a floral prototype, possibly that of the Egyptian lotus" It will be noted that in each of these cases the decoration and not the form itself seems to have received the major consideration.

This purely decorative origin of the volute capital has,

1- See Goodyear, Op. Cit. 115-137.
Hittorff et Zanth," Arch. antique de la Sicile", 335, Note 1.
Fletcher and Fletcher, "History of Architecture", 77.
Perrot and Chipiez, VII, Plates 52, 53.

2- Semper," Der Stil in den technischen und tektonischen Künster"

3- Clarke, "A Proto-Ionic Capital from the Site of Neandria", Amer. Jour. of Archaeol. II, 1886, 1.

4- Marquand, "Greek Architecture" 195.

however, been questioned by others. The contentions of Hittorff and Viollet-le-Duc, French authorities, have been well summed up by Professor Durm in his Baukunst der Griechen, when he says, " Diese Umstände haben wohl Hittorf und Viollet-le-Duc schon vor langer Zeit bei ihren Erklärungen des jonischen Kapitells veranlasst, das geschnitzte oder geschnitzte und bemalte Sattelholz als Ursprungsmotiv anzunahmen. Seine Form in Stein übertragen — unter Berücksichtigung der Materialeigenthümlichkeiten, also unter Vermeidung der zu grossen seitlichen Ausladungen - wird zum jonischen Saülen-Kapitell, besonders wenn dem Stammende noch eine entsprechende Bekrönung zugefügt wird".[1]

Here, there is at least an attempt, and no doubt a very plausible attempt, to explain upon structural grounds, the origin of the capital. One would scarcely question the opinion of so distinguished an authority upon a problem of this sort. He was convinced, evidently, of some sort of a structural origin for the capital. A similar conviction has led the writer to search for a more conclusive theory than that set forth by either Hittorff or Viollet-le-Duc.[2]

The wooden bolster-cap theory has seemed logical and in accordance with early stone examples but, upon the other hand, it has never seemed the whole story. Why should the spiral, even though it were, as has been shown, very much loved and universally used in decoration, have suggested itself as a capital decoration, especially, when its carving upon the wooden bolster-cap meant carving the spiral across the grain, when, clearly, the

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1- Durm, "Baukunst der Griechen", 246.

2- Viollet-le-Duc, "Entretiens sur l' Architecture.

longer dimension of the volute cylinder should run with the grain? These considerations have led the writer to seek a further explanation; and, in this connection, some premises have been assumed. In the first place, the fact that the Ionic capital presents two very different aspects, depending upon whether one views the capital front on or from the side, leads to the assumption that originally the form was placed so as to be seen from front or back and not from the side. This assumption accords with its use in many places in Asia Minor, especially upon such rock-cut tombs as those at Amyntas and others in Lycia.[1] Secondly, the volute cylinders, standing normal to the plane of the façade, as they do, must be, since they indicate structure, the descendants of a former structural form now obsolete by virtue of a change of materials. Thirdly, the attenuated proportions of the Ionic shaft points to a wooden origin, which has been assumed. And lastly, the omission of the frieze upon many early Ionic buildings in Asia Minor, together with the enormous size of the dentils, requires a further investigation for a possible wooden origin and an explanation that takes into account the structural significance of the capital, making it an integral part of the structure, at the same time.

In any wooden restoration the architrave, obviously, becomes a beam spanning the distance between columns. These beams are indicated by "a" in Fig. 12.(see p. 46) A study of the Asia Minor tombs seem to indicate that the dentils were originally beams, or at least wooden members, running normal to the direction of the architrave. This structural significance of the dentil has long

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1- See Sturgis and Frothingham, "History of Architecture" Figs. 147, 148, 153 etc.

been held by many authorities and universally appreciated. These are restored as wooden beams at "b", Fig 12. A study of the plan of the typical peristyle ceiling, loking up, shows beams running back from the columns and normal to the architrave. (Fig.13.) This would indicate that, in primitive times, this must have been a member at least as important in its direction as the architrave was in its direction, that is, it spanned the distance between the columns and the wall. This beam has been restored by two beams, "c" and "d", in Fig 12. These beams give us, at their ends the suggested cylinders of the Ionic capital.

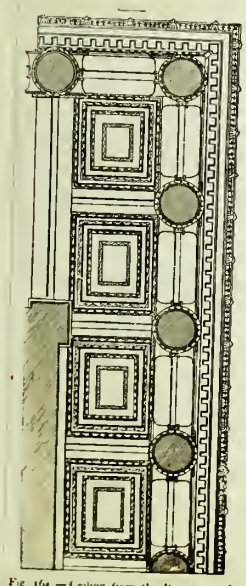

Fig. 164.—Ceiling from the Peripteros of the Mausoleum of Halicarnassus. Restoration.

Fig. 13.

But whence the volutes? It has long been noticed that,in primitive art, spirals and concentric circles have been used concurrently. This was true at Mycenae, in Crete, and no doubt, in Asia Minor. This tendency has been remarked by Haddon[1] who says, "There is a great tendency for spirals to degenerate into concentric circles; examples could be given from New Guinea, America, Europe and elsewhere. In fact, one usually finds the two figures associated together, and the consequence is one of decadence, never the evolution of spirals from circles. The intermediate stage has been aptly termed a 'bastard spiral' by Dr Montelius, 'that is to say, concentric circles to which the recurved junction lines give, to a causal glance, the appearance of true spirals' "

This is, doubtless, true among primitive peoples but scarcely

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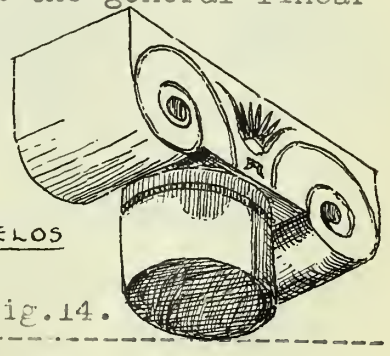
1- Haddon, Op. Cit. 93.

thinkable of the Greek Ionic artist before the Hellenistic period. The tendency of the Greek artist, in the ascendant period of Greek art, was to seek refinement rather than reduce any of his art to rule of thumb or cheap mechanical equivalent, a proceedure which cheapened Roman work. With the log ends in use, the next natural thing would seem their decoration. The concentric annular rings of the log suggested the concentric circles as early decoration, and further elaboration and a more advanced taste called in the spiral, which, as has been seen, was a prevalent form among all Aegean peoples.

This ornamentation was, no doubt, at first painted on but soon carving was resorted to, so that, by the time that stone construction succeeded wooden structure, the spiral ornament was inseparably linked with the form.

Obviously, the translation of this wooden structure into stone required considerable modification and it would seem, in the light of some of the early Ionic capitals, that a modification may have been made before this change from wood to stone. The intermediate form, between the earliest wooden type and such capitals as those from Delos (Fig. 14), may have been the bolster capital of Hittorff and Viollet-le-Duc. In the Delos capitals, the wide separation of the volutes and the general linear tendency points to a bolster-like prototype. Marquand[1] has pointed out this tendency in early Ionic capitals when he says, "The essential rectangularity of the Ionic capital is most evident in an archaic



DELOS

Fig. 14.

1- Marquand, Op. Cit. 92.

example from Delos, in which a single rectangular block has been but slightly modified in form". This rectangularity of some of the early capitals, no doubt, accounts for the bolster-block theory of the French authorities.

We have noted the wide separation of the volutes at Delos, On the otherhand, the Athens capitals (Fig. 15) present spirals tangent or almost tangent. The Athens capitals appear, almost, as stone translations of our log-ends, which persist now only as ornament, the beam itself having been raised to the level of the architrave, and not indicated upon the elevation at all. These archaic capitals from Athens are the most primitive Grecian Ionic capitals yet brought to light. This has led some authorities to hold that the Ionic capital was developed in Greece proper. Here, there has been no attempt to connect the volutes. There is, on the more primitive of the two examples shown (Fig.15 b) no intermediate palmette, met with on Fig.15 a, and on later capitals, and too the projection is not great. Fig.15 a shows a tendency toward a linear type which we may call a "bolster" Ionic.

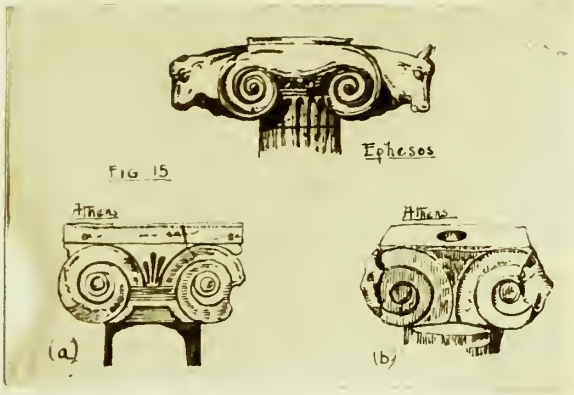
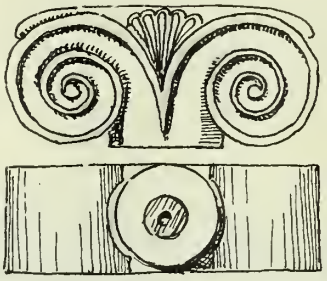


Fig. 15

In these primitive types the echinus is omitted and thus it would seem to have been a later refinement. Its introduction dates, no doubt, from a time after the change in materials from wood to stone, and in it we may see only the echinus of the Doric capital used as a support for the voluted bolster block, the volutes of which, naturally, had to be separated in order to make a nice union with the echinus. Such capitals as those found at Neandria, in the Troad, (Fig 16)

and Messa, in the Island of Lesbos, (Fig.17) appear as elaborate attempts to make the early spiral capital, born of structure, a decorative form. Even here the spirals appear distinctly Aegean in character, rather than Assyrian, being spirals of several turns while most of the Assyrian volutes are only spirally inclined forms. Here some oriental influence may be granted but this would not alter the argument in favor of a structural origin. Oriental forms are chiefly decorative and rarely simply structural. Ionic artists may have welcomed some suggestion to make the new structural form decoratively agreeable. On the whole, however, it seems that the Assyrian influence upon Ionic peoples has been tremendously exaggerated. We have no Assyrian voluted capitals unless the very crude spirally inclined capitals copied from Assyrian wall paintings (Fig.10) should be called voluted capitals.



CAPITAL FROM MESSA
Fig. 17.

It would seem strange that these forms should appear in wall paintings and yet not be realized in excavation. Thus they appear in the guise of fanciful conventions of the artists rather than the living forms of architecture. It would seem also that had the voluted capital ~~have~~ been known and used by the Assyrians, it would have been perpetuated by their successors, the Persians. The only capital with volute decoration is that found upon the Propylaea at Persepolis (Fig. 9) Here the volutes are used in the true oriental decorative manner, a spiral decoration against a vertical member, a method we have noted in Fig. 8. Its date, 480 B.C. would exclude this example from any consideration

in studying the origin of the Ionic capital.

The earliest well authenticated example of the Ionic voluted capital is that from the Archaic Temple of Diana (Artemis, at Ephesus, now preserved in the British Museum (Fig.18), which dates from 550 B.C. It is certain that the archaic capitals from Athens (Fig.15), Neandria[1] (Fig. 16), the Naxian votive column capital (Fig. 16), and the capital from Naukratis[2] (Fig.20) appear older than the Ephesian capital, principally upon account of their naive, archaic composition, but just how much older is a question. Anderson and Spiers[3] consider the Naukratis capital, an example discovered by Professor Flinders Petrie and dated by him at about 650 B.C., the oldest capital of this variety known; but it must be admitted that the votive column of the Naxians, at Delphi, has claims to a greater age[4] than the Naukratis capital. Especially

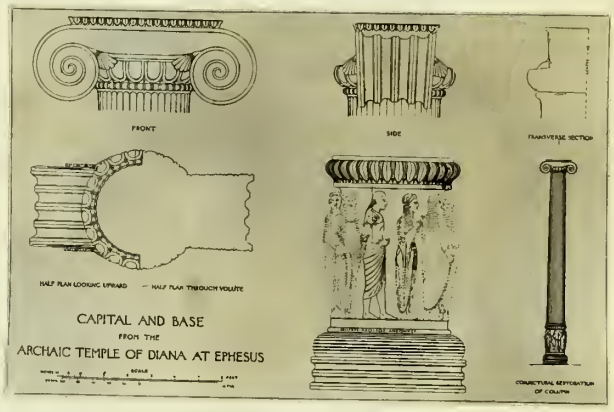


Fig.18.

1- Koldeway holds that the Neandrian capitals are not proto-Ionic but a new type which he calls "Aeolic". This capital, with its vertically springing spirals, is certainly more reminiscent of the Assyrian wall-painting spirals than any so far discovered. Yet even here, we may see, after all, an attempt to actually carve in stone the spiral ornament painted upon the block capitals of Athens.

2- Naukratis was a centre of cultural activity during the Ptolemaic Period and, just previous to the founding of Alexandria, was the chief trade centre of lower Egypt. It was given, as a trading place, to the Greek traders by Psammeticus I and due to the supremacy of the Greeks, here, temples were built to Greek gods. The capital referred to, the volutes of which are missing, is said to have come from a temple to Apollo. See King and Hall, "History of Egypt", 436.

3- Anderson and Spiers, "Architecture of Greece and Rome".

4 -Upon the basis of internal evidence.

will this be noted in the insufficient attempt of the Naxian column to stop the flutes under the embryo echinus, a thing which is adequately accomplished in the Naukratis capital.

It is a failing of historians and archaeologists to place anything found upon Egyptian soil in the list of Egyptian antiquities and to attribute to all Egyptian finds a great age. The Naukratis capital is, clearly, an Egyptian[1] interpretation of a Greek form, entirely out of keeping with Egyptian thought, even of the Ptolemaic Period, but, no doubt, done upon Egyptian soil by Greek artists.

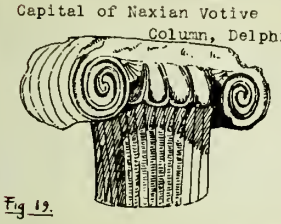

Capital of Naxian Votive Column, Delphi.

Fig 19.

The difference between the archaic examples from Athens and the Naxian capital is even more pronounced than the difference between the Naxian and the Naukratis types, and from internal evidence, these capitals represent our most archaic type of Ionic capital. In view of these finds at Athens, we may have to admit, eventually, that the earliest voluted capitals were developed in Greece, and carried into Ionia, where they were elaborated and modified, decoratively, by virtue of oriental association.[2] The internal evidence, of course, is not conclusive and the matter must be left thus until further finds of archaic types are reported. All the evidence so far presented, however, indicates that the Ionic voluted capital is not the product of Assyrian decoration but the development of a Grecian , or

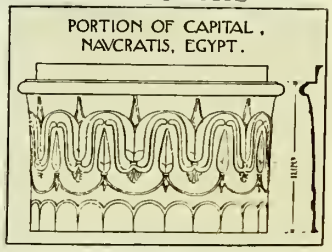


Fig. 20.

1- Egyptian, in the sense that it was discovered upon Egyptian soil.

2- Internal evidence may mean two things:
a- a more primitive type of development
b- or a retrogression from an advanced type, due to a barbaric handling.

at least an Aegean, structure. Its birthplace was in the west of that day not in the east (Tigris-Euphrates Basin).

IV. THE VOLUTE AS A FEATURE OF THE CLASSIC ORDERS.

1. The Ionic Order, Developed.-- Table I will give the reader a chronological arrangement of the various historic specimens of the Ionic voluted capital, but before discussing the voluted forms subsequent to the capital from the Archaic Temple of Diana, at Ephesus, perhaps some summary should be made of the handling of the volute, as a feature of the Ionic capital, up to that time.

Upon the archaic examples from Athens (Fig.15 b,, no attempt was made to connect the spiral ornaments of the block. In Fig. 15a, there is apparent an attempt, naive as it is, to join the two spirals in some kind of a composition. Here,perhaps, we find a reference to a floral inspiration, a thing very natural when we remember the general use of spirals that has been made in Greece up to this time. In each of these examples, the spirals spring vertically from the shaft, perhaps, in obedience to the principle that transition from a vertical to a horizontal should be emphasized. In the case of Fig. 15 b, however, the ornament does not suggest a floral derivation, and the spirals are so close together as to indicate that the ornament was meant to be abstract and not suggestive of any particular form.

In the Neandrian capital which has been heralded as a distinct type by Koldeway, the spirals still spring vertically and there is some attempt to fill the triangular space with floral ornament. This capital betrays, most clearly, its inspiration,and in a way,

appears as an ultra-decorative version of the voluted form, and most likely, not in the line of development that culminates in the Ephesian capital.

With the capital from Delos (Fig.14), there is more of an attempt to unite the volutes, which here spring horizontally. But even here they are still separated by a small floral form. The echinus which is to become an important part of the Ionic capital, here, becomes prominent, and although the projection of the volute is still very great and the un-fluted shaft makes a poor junction with the echinus, unmistakable signs of development are apparent.

Fig. 21.

Fig. 22.

With the Ephesian capital there comes a complete union of the volutes although, still, the great projection, sidewise, is to be noted. Here also is noted, for the first time, the cushion used upon the horizontal portion of the volutes, a feature which gives the Greek Ionic examples much of their grace and lightness, and a feature, which was discarded later, due no doubt to the increasing importance of the the echinus, much to the detriment of the form.

Fig. 23.

From the Archaic Temple of Diana at Ephesus it is possible to trace the development of the Ionic capital to its perfection upon the Erechtheum. This the writer has chosen to do by a pictorial presentation. (See Figs. 21, 22, 23, 24, and 25.) The subsequent story of the Ionic order, its introduction and use at Rome and its revival during the Renaissance, as well as its general employment during our own times, is a matter of most common knowledge. It has not seemed necessary to review this mass of material so familiar, now, to the layman as well as to the student and architect, except, perhaps, in a graphical way, and to this end the following illustrations have been included.(Figs. 25a, 26, 27a, 27b, 28, 29, 30, and 31).

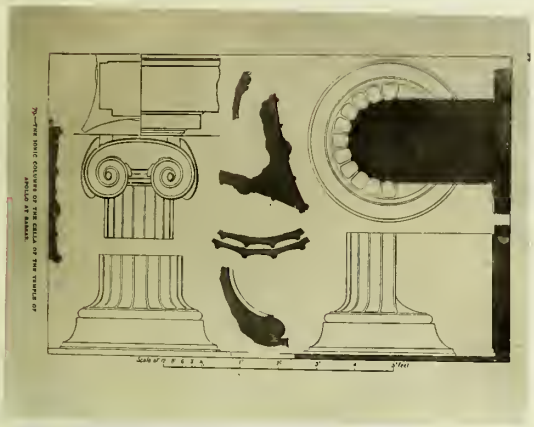


Fig. 24-Bassae.

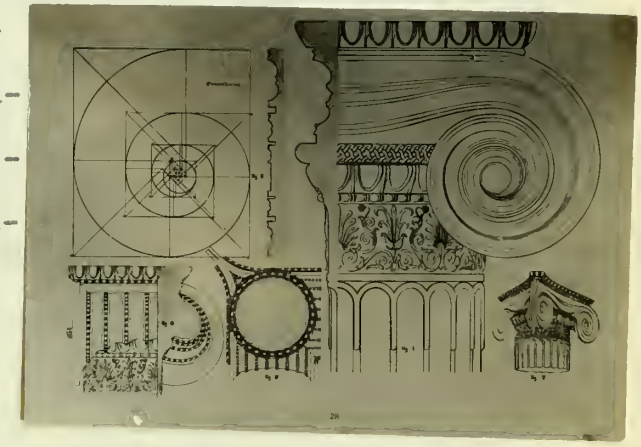


Fig 25- Erechtheum.

2. The Corinthian Capital-- Something of the use of voluted forms upon bell or basket shaped capitals should be recalled here. This use was made not only upon the Corinthian capitals of Greece (Fig. 35.) and Rome (Figs. 36, 37, 38, 39, 40) but also upon such bell shaped capitals as that from Philae (Fig.34.), an example dating from the Ptolemaic Period and due most likely to Grecian influence. Fig. 32 will serve to recall the revival of this type during the Renaissance. But this use of volutes is

now very generally appreciated and these illustrations should serve to delineate the general trend of that use.

V. THE VOLUTE IN LATER CAPITALS.

1. Early Christian and Byzantine.-- While the use of the volute has long been appreciated as far as its use upon the classic capitals is concerned, this use upon the capitals of the Middle Ages has not been so generally remarked. In this connection, it has seemed necessary to point out something of the trend of voluted forms in architecture between the time of the fall of the Roman Empire in the west and the culmination of the Gothic Period. This has been done principally because the volute has so long and often been considered a classic element, confined to classic periods or classic revivals. It was thought that, by pointing out the continued and unbroken use of the volute, in one form or another, during the Middle Ages, this use, together with the well known popularity of voluted forms during the classic periods and the Renaissance, would serve to establish, beyond a doubt, the writer's original contention and purpose in presenting the study, namely: that the volute is a universal element in nature, consequently in art, and that as such it persists and will continue to persist so long as we live in our present environment. The tracing of volu-

Fig. 25a.
Comparative.

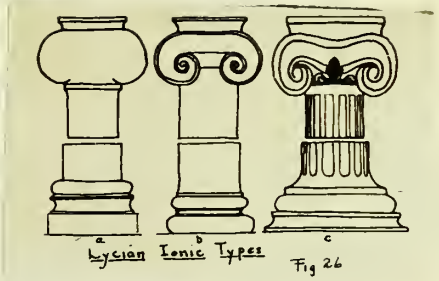


Fig 26

ted forms during the Middle Ages requires, likewise, no very strong written argument and a pictorial presentation is perhaps as effective here as any other procedure.

Fig. 27a.

Of the types of orders in use at Rome during the Empire, only the voluted types, that is the Ionic, Corinthian and Composite, seem to have been used by the builders of the early Christian churches. Of the voluted forms, the Ionic was less used than its relatives, the Corinthian and Composite. These two types were produced by thousands in every Roman province, even as far away as Britain. This general class of captals we call by the name Corinthian-esque, for the Corinthian-like variety far surpassed the Composite in its frequency of use, and served as the prototype of the Gothic crocket capitals of a later period.

Fig. 27b.

We have already noted that capitals of the Corinthian, bell or basket type have been used with and without voluted decoration from the time of Egypt on down, and with the early Christians, Byzantines and subsequent church building peoples, the volute receives its full due of attention. With the second century, the artists sacrificed Roman types for freer versions, and from these beginnings it is possible to trace the complete transition to the

foliated Gothic capital of the eleventh century. However, Roman forms persist, in some localities, even down to the eleventh century, a good example of a free version of a Roman variety having been used upon the church of St Pierre-le-Moutier, at Nièvre, France. (Fig. 41.)

Fig. 28.

2. Romanesque and Gothic.-- Forms more medieval in character, yet at the same time retaining the volutes, are shown in Fig. 42., a capital from the nave of the Cathedral of Toulouse or Fig. 43., a capital from the nave of the church at Aignan, both of which retain the volute as an essential part of their makeup. The Romanesque capital from the Cathedral of Bayeux (Fig. 44.) represents a development midway between the Toulouse type and the example from St. Martin de Champs, Paris (Fig. 45.) The volute in this latter type becomes the Gothic crocket[1] and persists not only in the capital but also in the finials of the period. In this connection it should be noted that the crocket proper (circa 1192) does not come into existence until after the so-called "crochet" capital, which was derived from the classic Corinthian type, as indicated, and which gave rise to the "crocket" proper. The term "crocket

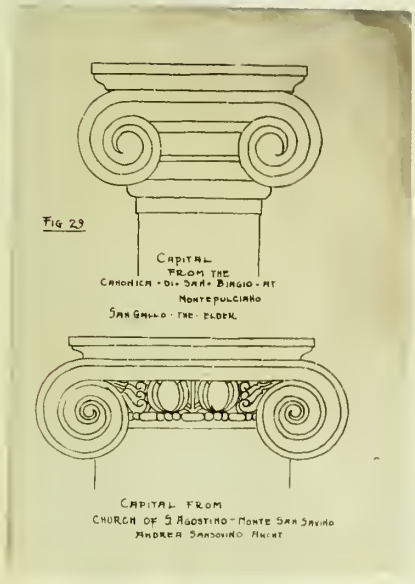


Fig. 29.

1- Bond, "Gothic Architecture in England", 429.

capital, however, is a convenient, although an historically incorrect and confusing, term.[1]

From the Saint Martin de Champs capital, it is but a step to the "wind-blown" Salisbury capital (Fig. 47.), where the volute almost loses all semblance to its early prototypes in the curly whorls of foliage. This type marks the culminating phase of the volute capital during the Gothic period.

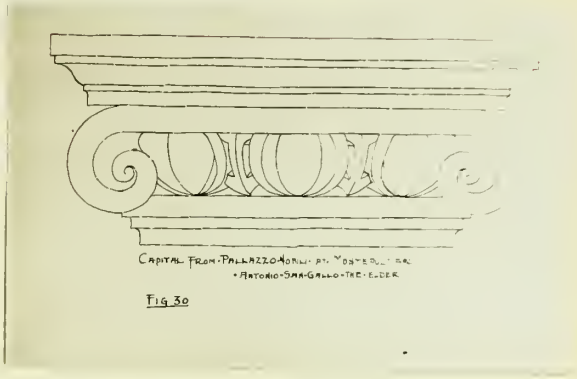


Fig. 30

Fig. 31

Another type of capital used in Byzantine, Romanesque, and Gothic art was the cubical block type, and even upon this form, although there is no structural place for voluted forms, the volute often persists in the decoration, as will be noted in the Sancta Sophia capital (Fig. 48.), the St. Peter, Northampton, capital (Fig. 49.) and the capital from the Musee d' Arles (Fig. 50.), a Gothic version of the cubical block type.

VI. THE VOLUTE IN OTHER STRUCTURAL FORMS.

Aside from these considerations of the use of the volute upon the capital, some attention should be paid to its use in other structural forms, where it persisted with as marvelous an insistence as in the capital. Among these forms employing the

---

1- For crochet see Fig. 46.

volute as a motif,may be mentioned consoles, modillions and transitional brackets.

The employment of the volute as a motif for supporting members hinges upon its abiiity to make a graceful transition from the vertical to the horizontal and vice versa. In this connection the spiral motif is usually a double one, employing two spirals winding in opposite directions as will be noted in Fig. 56. A form thus composed serves as a bracket horizontally or vertically, and in this capacity, has served its purpose from the time of the Erechtheum doorway, and similar Greek doorways, down through the ages to our own times.

Fig. 32.

The voluted console form has likewise been employed as a keystone for arches upon such structures as the Roman triumphal arches and similar examples. A similar bracket-like use is the employment of the motif as modillions upon the entablatures of the Corinthian and Composite orders

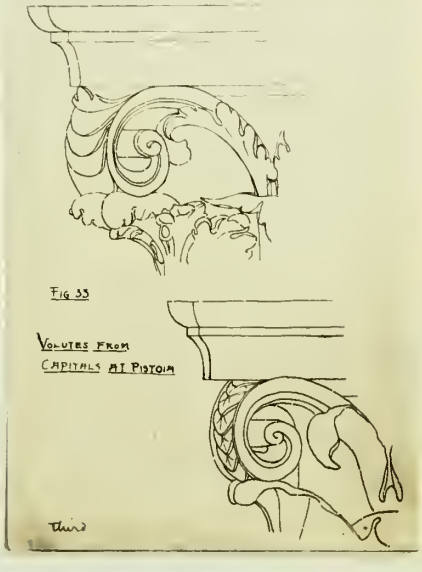


Fig. 33.

In addition to these well known uses in a structural manner, volutes have been employed to make transitions in line in situations where their structural significance becomes void. An example in point would be the great scrolls used in a buttress-like fashion, but purely for aesthetic purposes, upon the Church of Santa Maria della Salute at Venice. Again upon other Renaissance

buildings voluted, inverted, bracket forms have been used to make the transition, upon the façade, from the clerestory wall to the walls of the side aisles, well known examples of which use are to be found upon the various Jesuit churches of Italy.

VII. THE VOLUTE IN ARCHITECTURAL DECORATION.

The use of spiral decorative forms, as architectural decoration in Egypt, Assyria and early Greece, have already been mentioned.

Fig. 34.

In its primitive use the spiral figured in decoration either as running ornament or as all-over decoration. (See Fig. 51) These same motifs persisted in Greek architectural decoration of a later period, appearing in various forms and manifestations, (See Plate I, and were subsequently handed down to Rome, where they were favorites, used especially as running ornament, but rarely in all-over patterns. (See Figs. 11 and 52,

From Rome the spiral, as running ornament found its way into the hands of the early Christians and Byzantines, (Fig. 55, perpetuated itself during Romanesque times (Fig. 49.), and culminated during the Gothic Period (Figs. 53 and 54.) Its revival as running ornament or as a terminal motif, during the Renaissance, was a matter of course. It was accorded the same place as other classic forms.

Fig. 35.

VIII CONCLUSIONS.

And voluted forms still persist today, both as structure and as ornament. The reasons are at once obvious and potent. The use of the spiral or double spirals as a means of transition from a vertical line to a horizontal line, or vice versa, is well grounded. It is one of the few graceful transition forms. Its universal occurence in nature and its general appreciation by all mankind has been pointed out. Its long employment in the field of art would give it a momentum difficult to overcome even if it were not still an inspiring motif in nature about us. With these considerations, then, it must appear that the volute in one form or another, as decoration or as structure must persist indefinitely.

Fig. 36.

Fig. 38.

Fig. 39.

Fig. 37.

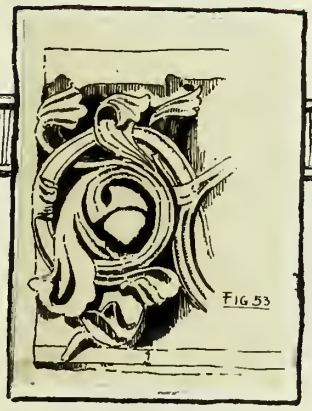


Fig. 53.

Fig.40.

Fig.52.

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Fig 41.

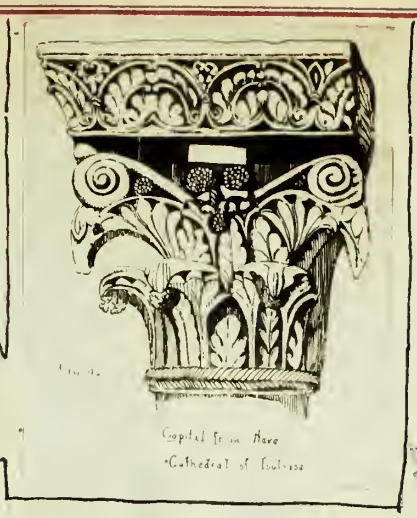

Fig. 42.

Fig.45.

Fig. 47

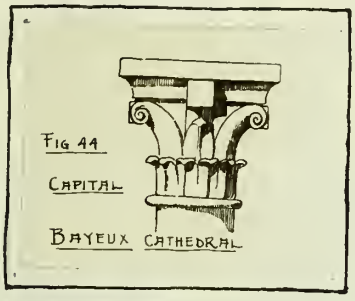

Fig. 49.

Fig. 43.

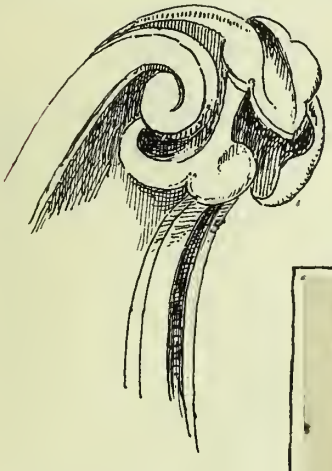

Fig. 46.

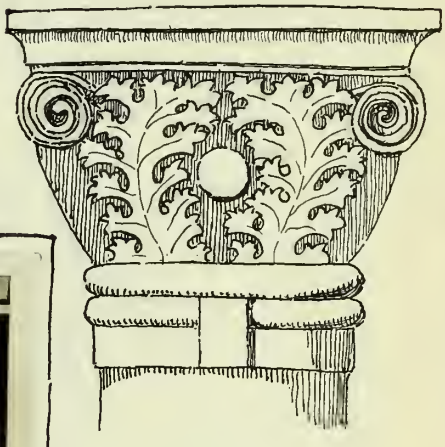

Fig. 48.

Fig. 56

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Fig. 50.

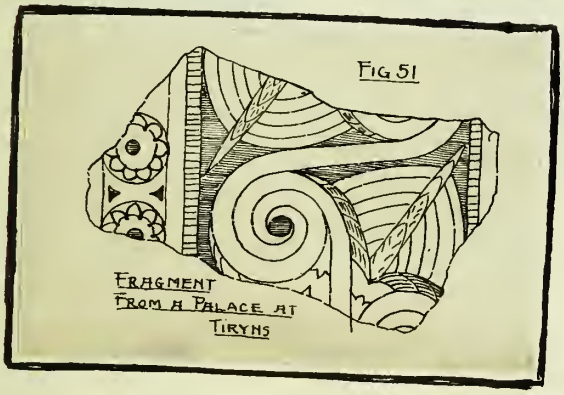
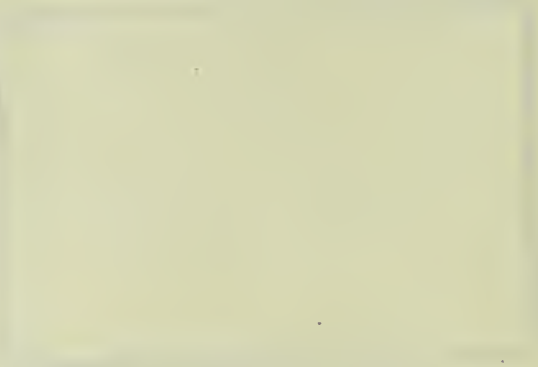


Fig. 51.

Fig. 54.

Fig. 55.



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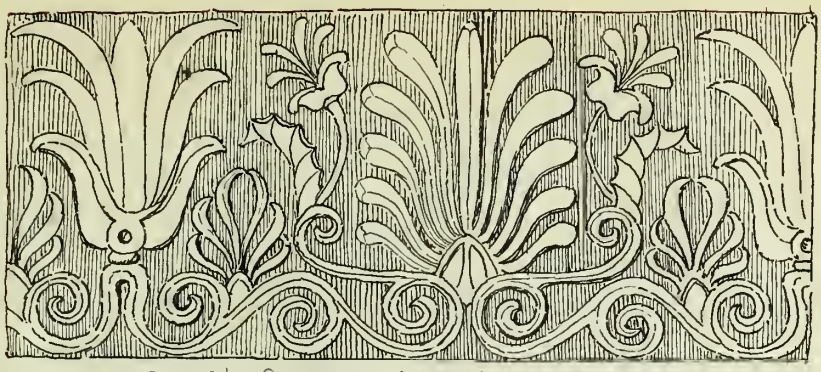
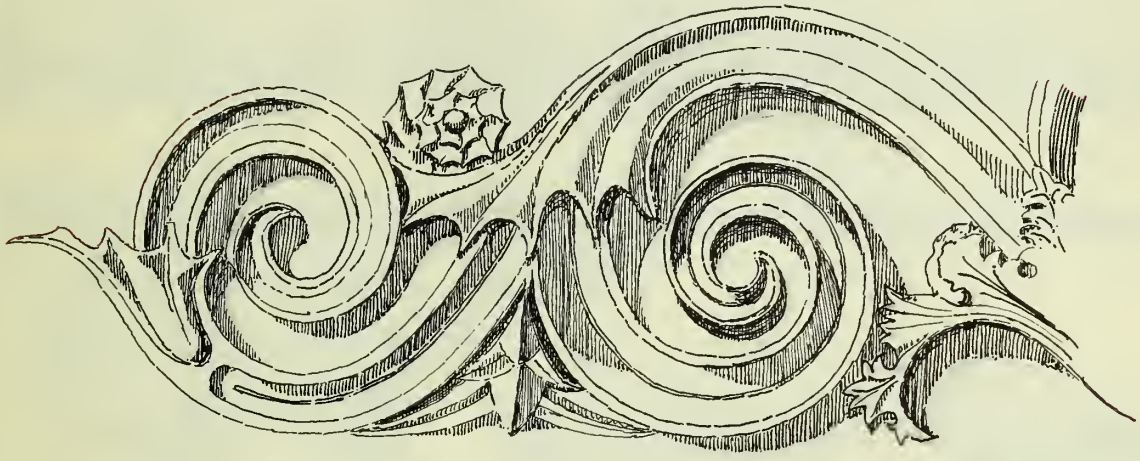
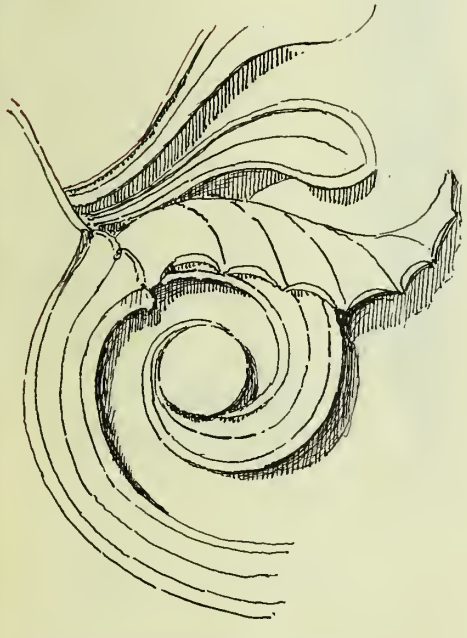


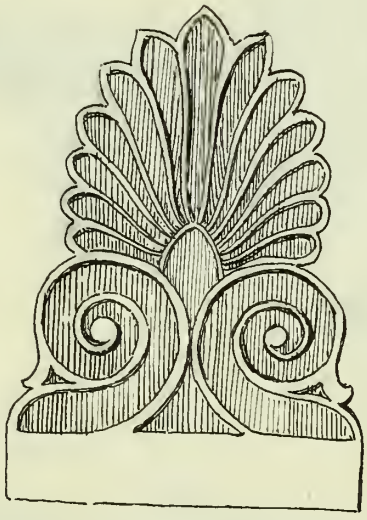
Greek Ornament- after Mauch.



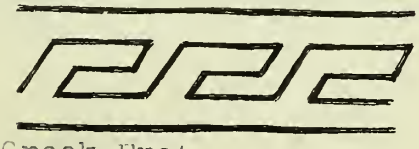
Ornament from Choragic Monument of Lysicrates,
after Vulliamy.



Detail-Erechtheum
after Mauch



Greek Antefixa
after Bühlmann



Greek Fret
from Owen Jones

PLATE I.

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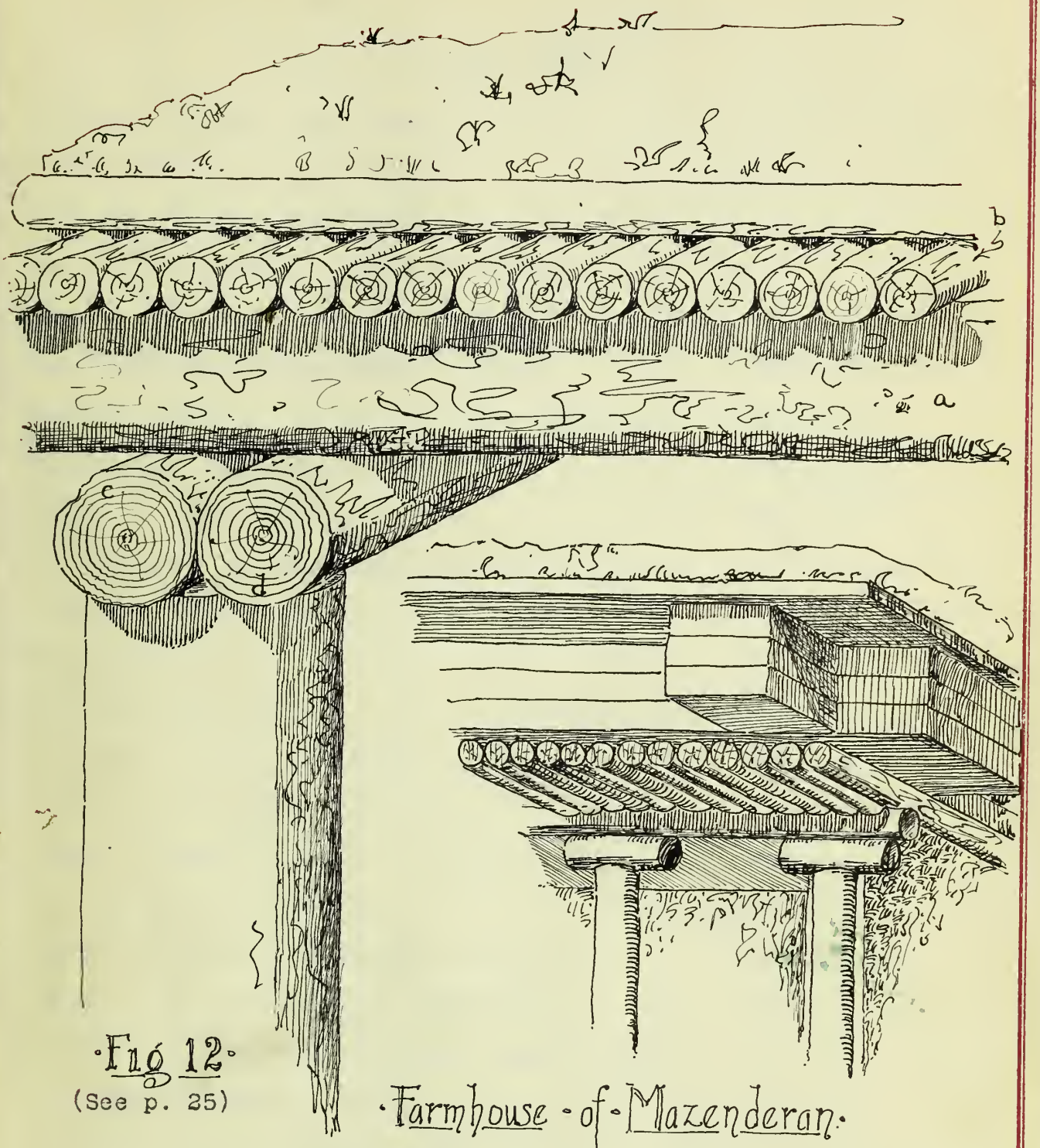


Fig 12.
(See p. 25)

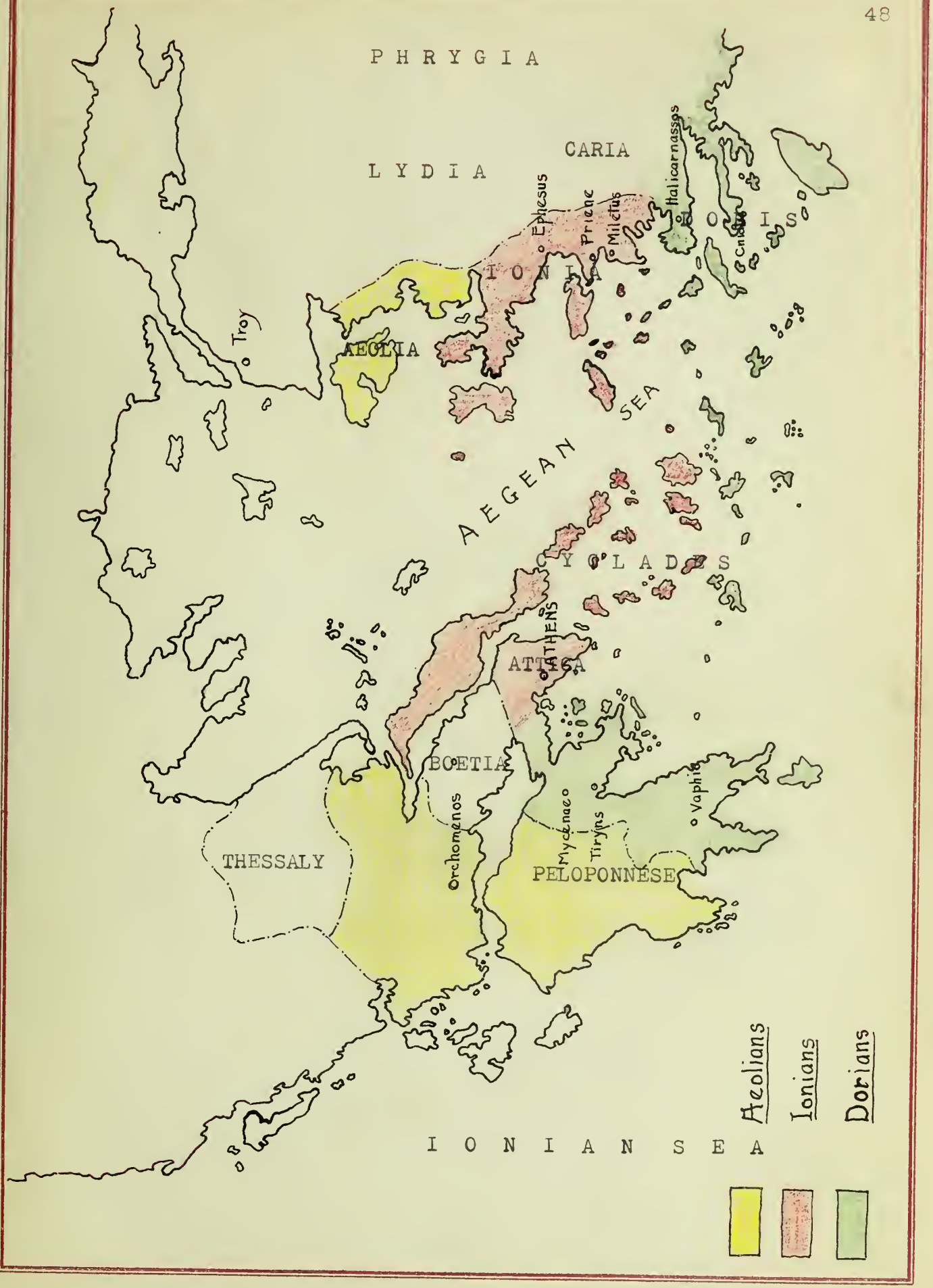
Farmhouse of Mazenderan.
After Durm who credits Dieulafoy.

PLATE II.

TABLE I.

List of Important Ionic Examples.

Archaic Capitals from Athens.	
Naxian Votive Column, Delphi.	
Archaic Capitals from Delos.	
Capital from Messa, Island of Lesbos.	
Capital from Neandria, in the Troad, Asia Minor.	VII Cent. B.C.?
Temple of Apollo, Naucratis, Egypt	650 B.C.
Archaic Temple of Diana (Artemis), Ephesus	550 B.C.
Temple upon the Illisus, Athens	484 B.C.
Temple of Nike Apteros, Athens	438 B.C.
Propylaea at Athens (Internal Order,	437-32 B.C.
Temple of Apollo, Bassae near Phigaelia (Int.Col)	430 B.C.
Erechtheum	420-393 B.C.
Various Lycian Tombs	5th and 4th Centuries B.C.
Mausoleum of Halicarnassos	354 B.C.
Temple of Dionysus, Teos.	350 B.C.
Temple of Hera, Samos.	350 B.C.
The Philipeion, Olympia.	338 B.C.
Temple of Apollo Didymaeus, near Miletus.	335-320 B.C.
Temple of Diana (Artemis,, Ephesus.	330 B.C.
Temple of Athena Polias, Priene (near Miletus,	320 B.C.
The Cybel's Temple, Sardis	
Altar of Zeus at Pergamum Etc.	
Temple of Fortuna Virilis, Rome.	100 B.C.
Theatre of Marcellus, Rome. Superimposed Order	23-13 B.C.
Colosseum, Rome. " "	70 A.D.
Temple of Saturn, Rome.	284 A.D.


PHRYGIA
LYDIA
CARIA
Halicarnassus
Ephesus
Priene
Miletus
IONIA
AEOLIS
Troy
AEOLIA
SEA
AEGEAN
CYCLADES
ATHENS
ATTICA
BOEOTIA
Orchomenos
Mycenae
Tiryns
Vaphio
THESSALY
PELOPONNESE
IONIAN SEA
Aeolians
Ionians
Dorians

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